

WHAT IS CLAIMED IS:

1. A collapsible cylindrical endoprosthesis comprising:

a plurality of longitudinal members in a cylindrical arrangement, each having at least one end;

a plurality of circumferential members connecting the ends of adjacent

5 longitudinal members; and

a plurality of opposed contact surfaces on adjacent longitudinal members

near the circumferential members, with the opposed surfaces being oriented relative to each other, wherein, as the endoprosthesis is collapsed, the circumferential members bend until the opposed contact surfaces come together and then continued deflection of the

10 longitudinal members produces stress at the contact surfaces.

2. The collapsible cylindrical endoprosthesis of claim 1, wherein the manner of bending distributes the stresses throughout the longitudinal members and circumferential members.

3. The collapsible cylindrical endoprosthesis of claim 1, wherein the circumferential members comprise a loop.

4. The collapsible cylindrical endoprosthesis of claim 1, wherein the circumferential members comprise an eyelet configuration.

5. The collapsible cylindrical endoprosthesis of claim 1, wherein the circumferential members comprise a merge section of the ends of adjacent longitudinal members.

6. The collapsible cylindrical endoprosthesis of claim 1, wherein the longitudinal members further comprise a width measured circumferentially and a thickness measured radially wherein the thickness is greater than the width.

7. A collapsible cylindrical endoprosthesis comprising:
a plurality of longitudinal members arranged adjacently into a cylindrical configuration each having a first end section, a middle section and a second end section;
a first plurality of eyelets connecting adjacent longitudinal members at
5 the first end sections;
a second plurality of eyelets connecting adjacent longitudinal members at the second end sections; and
a plurality of merge sections connecting adjacent longitudinal members at the middle section.

8. The collapsible cylindrical endoprosthesis of claim 7, wherein the first plurality of eyelets and the second plurality of eyelets connect the same longitudinal members forming pairs of longitudinal members connected at both the first ends and second ends.

9. The collapsible cylindrical endoprosthesis of claim 7, further comprising:

opposed contact surfaces on the longitudinal members near the first plurality of eyelets and the second plurality of eyelets wherein the contact surfaces come together when the prosthesis is collapsed.

10. The collapsible cylindrical endoprosthesis of claim 9, wherein the first plurality of eyelets and the second plurality of eyelets bend while the endoprosthesis is collapsed until the contact surfaces come together and the longitudinal members bend thereafter.

11. The collapsible cylindrical endoprosthesis of claim 7, wherein the stresses due to collapsing the endoprosthesis are distributed between the longitudinal members, the first plurality of eyelets and the second plurality of eyelets.

12. The collapsible cylindrical endoprosthesis of claim 8, wherein alternating pairs of longitudinal members define a first longer length between the first end section and the middle section and a second shorter length between the first end section and the middle section.

13. The collapsible cylindrical endoprosthesis of claim 12, wherein alternating pairs of longitudinal members define a first longer length between the second

end section and middle section, and a second shorter length between the second end section and the middle section.

14. The collapsible cylindrical endoprosthesis of claim 12, wherein upon collapsing the endoprosthesis the eyelets connecting alternating pairs of longitudinal members defining the second shorter length nestle below the eyelets connecting alternating pairs of longitudinal members defining the first longer length.

15. The collapsible cylindrical endoprosthesis of claim 7, wherein each longitudinal member defines a width measured circumferentially and a thickness measured radially, wherein the thickness is greater than the width.

16. A compressible endoprosthesis configured to secure an endoluminal graft within a body lumen, comprising:

a plurality of curved beams arranged longitudinally in a cylindrical structure, each beam having at least one end;

a plurality of merge sections formed by adjacent curved beams merging together;

at least one eyelet formed in a merge section at the ends of adjacent curved beams; and

wherein at least one eyelet provides an anchor for stitching the endoprosthesis to the endoluminal graft.

17. The endoprosthesis of claim 16, further comprising:

opposed contact surfaces on the curved beams near the at least one eyelet, wherein the contact surfaces come together when the endoprosthesis is compressed.

18. The endoprosthesis of claim 16, wherein the at least one eyelet is configured to distribute stress throughout the curved beams while the endoprosthesis is compressed.

19. An expandable endoprosthesis comprising:

a plurality of curved beams arranged longitudinally in a cylindrical structure, each beam having at least one end;

a plurality of merge sections formed by adjacent curved beams merging together; and

at least one bulbous extension formed in a merge section at the ends of adjacent curved beams.

20. The endoprosthesis of claim 19, wherein the endoprosthesis is formed from a single integral structure.

21. A collapsible cylindrical endoprosthesis comprising:

a plurality of curved longitudinal members in a cylindrical arrangement, each having a proximal end and a distal end;

a plurality of proximal connections integrally formed by the proximal ends of adjacent longitudinal members;

a plurality of distal connections integrally formed by the distal ends of adjacent longitudinal members; and

the cylindrical endoprosthesis has a first diameter sized to compress against the interior of a corporeal lumen and a second smaller diameter sized to fit within a delivery catheter;

wherein the cylindrical endoprosthesis withstands stresses induced by collapsing through bending of the curved longitudinal members.

22. The collapsible cylindrical endoprosthesis of claim 21, wherein the proximal connections further comprise a looped configuration.

23. The collapsible cylindrical endoprosthesis of claim 21, wherein the distal connections further comprise a looped configuration.

24. The collapsible cylindrical endoprosthesis of claim 21, wherein the plurality of curved longitudinal members further comprise pairs of opposed contact surfaces on adjacent members.

25. The collapsible cylindrical endoprosthesis of claim 21, further comprising:

a plurality of bulbous extensions attached at the ends of the connections.